

**A Brief Comparative Study of the *Tetrabiblos* of Claudius Ptolemy
and the Vedic *Surya Siddhanta*.**

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Abstract

The Ancient Indians and Greeks had similar beliefs in the concepts of magic, superstition, and astrology. First I will look briefly at the beliefs of the ancient Greeks and the main astrological text—the *Tetrabiblos* of Claudius Ptolemy. Ptolemy moves away from the scientific account that he provides us in his *Almagest*, to defining astrology as an art acquired from the observation of the movements of the heavenly bodies. The main argument however is based on the fact that Ptolemy uses an almost apologetic tone in his defence of the *Tetrabiblos*. Whereas the ancient Indians appeared to be strong believers in astrology, the ancient Greeks always sought to justify it in terms of science. To analyse this concept in depth I will provide a comparative study of both these belief systems.

But whereas the Greeks distinguished astrology from astronomy, in the Vedic tradition astrology consisted of observable science as well as mythological and magical elements. Some consideration must therefore be given to astronomical aspects of this tradition in drawing a comparison between the two. Astrology was prevalent in ancient India a long time prior to the writing of the *Surya Siddhanta* or any other astronomical text. The *Surya Siddhanta* is often held to be the main text on Indian astronomy as it tries to address the reasons why certain religious practices were performed at those specific times. However, much information can also be obtained from the verses of the *Rig Veda*, a religious text that formed the basis of Indian astrology. This mini-dissertation will first discuss the *Surya Siddhanta* and its relationship to the more ‘mythological’ *Rig Veda*.

In order to reach a conclusion I will look specifically at the issue of the belief in individual human difference and fate and destiny in these two cultures.

Declaration

I, Trishana Ramluckan, hereby declare that the work submitted is entirely my own unless so indicated in the text, and that no part of this work has been submitted for a degree at any other University.

Signature: _____

Supervisor's Declaration

I, Professor J. L. Hilton, hereby approve this mini-dissertation for submission.

Signature: _____

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Abbreviations

I have made use of the following editions in this dissertation. All references and translations are taken from these texts.

Rig Veda = *RV*. R.T. Griffith, tr. (1896) *Rig Veda*.

Surya Siddhanta = *SS*. E. Burgess, ed. and tr. (1859) *Surya Siddhanta*. New Delhi.

Tetrabiblos = *T*. W. G. Waddell and F. E. Robbins, ed. and tr. (1964) *Manetho; Ptolemy:*

Tetrabiblos. Cambridge, Mass. and London: Heinemann.

Chapter One: Introduction

Astrology has been the focal point of many ancient civilisations but some critics seem to think that it has become more popular in today's 'new age'. However astrology did develop in the ancient world and has since become integrated into modern societies. Tacitus (*Ann.* 6.20 tr. Church and Brodribb) describes the ancient view of the art: 'among the wisest of the ancients and among their disciples you will find conflicting theories, many holding the conviction that heaven does not concern itself with the beginning or the end of our life, or, in short, with mankind at all; and that therefore sorrows are continually the lot of the good, happiness of the wicked; while others, on the contrary, believe that though there is a harmony between fate and events, yet it is not dependent on wandering stars, but on primary elements, and on a combination of natural causes. Still, they leave us the capacity of choosing our life, maintaining that, the choice once made, there is a fixed sequence of events.' While the Epicurean philosophers of ancient Greece argued over its validity in society and regarded it as superstition, the Stoics accepted this concept as a valid part of science and religion. Astrology involved the observation and calculation of the universal elements at given times. Although things happen according to fate, this depends not on astral movements but on the principles and logic of natural causality.

The two ancient stargazing civilisations that will be researched in this dissertation are India and Greece. The main information comes to us through three texts: the Vedic *Surya Siddhanta* and *Rig Veda* and Claudius Ptolemy's *Tetrabiblos*. The *Tetrabiblos* not only distinguishes between astronomy and astrology but also accommodates the belief system of the Hellenistic Greeks in the concepts of fate, destiny, and individual human difference. The astrological texts of both these cultures are of significant importance in providing the relevant information needed to establish the concepts mentioned above.

While the modern scholar Otto Neugebauer argues that astrology must be considered to be an important part of Hellenistic science (1962: 171), Bouché-Leclercq states that it was an idea which was virtually unknown or neglected in Greece before 3BC (1899: 2), but that it was introduced to the Greeks by a Chaldean priest known as Berosus in the early third century BC. Although these claims may be valid, an analysis of the ancient texts is of importance. In his *Tetrabiblos*, Ptolemy bases his entire cosmology upon Aristotle's theory of the five elements, which was later modified by the Stoic philosophers. There is an important distinction between astrology and astronomy in the ancient world, but in order for the Greeks for astrology to persuade, it has to be validated by astronomical phenomena—the planets that govern all activity on earth whether it is negative or positive. Astronomy is an important factor in the determination of astrological occurrences and astrology should therefore be regarded as a pseudo-science. Ptolemy explains this well in the *Tetrabiblos*.

In Book 3, however, he states the importance of casting personal horoscopes and the role of the moon in so doing. And although Ptolemy emphasises the moon's intervention in the *Tetrabiblos*, during the Hellenistic period, the worshippers of the sun and moon gods were referred to as barbarians.

During the Vedic period in India, approximately 3000BC, astrology was incorporated into the culture and religion. Astronomy, however, was intertwined with the astrological branch, and the result was known as *Jyotish*. The *Rig Veda* (tr. Griffith 1896) mentions *Jyotish* in great detail but the information that is obtained has to be separated from a mythological context. It does however contain information about the planets together with the sun and moon and the effects these have on the lives of individuals which the ancient Greeks called genethliological horoscopy.

The most notable Indian astronomical text is the *Surya Siddhanta* which is a Sanskrit text written in AD 600 approximately. While the *Rig Veda* followed the concept of the lunar

calendar, the *Surya Siddhanta* is believed to have adopted the solar calendar from the Greeks. It establishes the Hindu day count together with the calculations of eclipses. The *Rig Veda* (*ibid*) used a twenty-seven fold zodiac while the *Surya Siddhanta* uses the twelve-fold western system.

The *Surya Siddhanta* was named after the sun god Surya. The *Rig Veda* (bk 10:hymn 37) does mention a hymn dedicated to Surya, which speaks of the chariot of Surya which is being drawn by through the sky by seven mares. In this treatise the number seven is significant because they represent the seven celestial bodies, which are visible through the naked eye. They are the sun and the moon together with the five planets: Mercury, Venus, Mars, Jupiter, and Saturn. The *Surya Siddhanta* is similar to the *Tetrabiblos* in many ways, though it must be noted that prior to the introduction of the *Surya Siddhanta*, the *Vedas* provided all the astrological information that was needed and is still in use in modern-day India.

The following chapters will address the issues of the beginning of astrology, which consults the origin and spreading of astrology and its importance and development through the ancient world. Chapter three will provide us with a brief insight into the relationship between astronomy and astrology in the Greek world. The next chapter is an analysis of the *Tetrabiblos*, which will include the subjects of the astrology of nations – discussing the outcomes of populations according to their positions in relation to their planetary rulers, the link between astrology and its physical effects on man i.e. astrology and medicine, the concepts of individual differences will also be discussed together with Ptolemy's ages of man.

The Vedic aspects will focus on similar subjects, which will include the astrology of nations and the concepts of fate and destiny. The mythological and scientific causes of eclipses will also be addressed. In concluding this dissertation a brief comparative study of these two ancient astrological nations will be provided.

Chapter Two: The Origins of Astrology

Lindsay (1971: 1-29) investigates the origins of astrology in Babylonia. Why did man first begin to believe that the sun, moon, and visible planets influence his character and his life and all life on earth for that matter? The answer to this question is that this all began as soon as man was capable of intelligent thought. His realisation of such a phenomenon began with the sun which he deemed to be the source of light and warmth. The sun was the ruler of all living things. The moon was responsible for the swelling and sinking of tides. It affected all natural cycles, and in an astrological sense was responsible for the emotional stability of an individual.

The oldest evidence for the origin of astrology was found in Babylonia, and dates back to at least 1500BC. This was the period in which the first agricultural systems evolved, when farmers began to recognise the difference in quality between the morning sun and the afternoon light. This became important to them as it indicated at which times plants may be grown and crops harvested. All these factors had to be taken into careful consideration to ensure their success.

Astrology was born at a time when the world was rife with superstition and man revered magic—at a time when man considered the 'moving lights' in the night sky to be manifestations of gods. From the earliest history came a number of cuneiform tablets, which were brick and stone slabs inscribed with triangular or wedged-shaped characters. These tablets recorded the simplest astronomical phenomena including the eclipses of the moon and visible planetary movements.

These signs were regarded as predictions as to the state of affairs of current situations—signs of famine or war, peace or plenty. The Babylonians were a superstitious people and readily believed in signs and omens, which included the bites of certain animals,

the meaning of dreams, the patterns in bird flight, and the appearance of a newborn baby. It was believed to be a bad omen if a baby was born with small ears, as the house would fall to ruin. Astronomical phenomena were common to several civilisations in the Far East and the Incan and Mayan civilisations of South America. At that particular time the planets which were visible through the naked eye were Mercury, Mars, Venus, Jupiter, and Saturn. These planets were given the names of gods, and thereby identified. The movements of these universal bodies were significant for the foretelling of future occurrences.

Cumont (1912: 141) states that astrology and astronomy first appealed to the intellectual elite, winning over any speculative minds, and that it introduced the theory on the relationship between the universe and the individual. But this interest in the study of astrology leaned toward the creation of mystic cults. Cumont (*ibid*) states that according to the Greeks the *cosmos* remained limited because if one could define all the planets and stars and their relationship to all of mankind, then it would certainly mean that man had no or little free will. Thus astronomy became like geography—limited and defined.

Crossing the boundary of science, astrology was defined in Greek terms as evolving from the words *aster* meaning star and *logos* meaning discourse. It further implies a discourse between man and the universal elements. However, what is important in the development or history of astrology is that while Babylonian astrology focused on the prediction of future events on the movements and positions of the planets, Greek astrology followed a scientific approach of cause and effect (Whitfield 2001: 1).

Astrology was based upon two systems, the first system involved the heavens and their movements and the second involved the individual and collected destinies of mankind on earth. Culianu (1987: 478) believes that astrology was a product of Hellenistic society but also states that Mars and Saturn were considered as maleficent planets. This was surely

adopted from Babylonian astrology. He later admits that Greek astrology was a combination of Greek science and Chaldean mysticism.

What has been established in this chapter is that astrology originated in Babylonia, and was adopted from them by the Greeks. Babylonian astrology contained the fundamental principle that astrology always existed in a rudimentary form throughout history as stated by Holden (1996: 1). However there still remains much debate over the aspect of Vedic astrology as the ancient texts — the *Rig Veda* — imply that astrology has also always existed once again in a rudimentary form. These concepts will be discussed further in Chapter 5.

Chapter Three: Astronomy and Astrology in Ancient Greece

Sarton (1959: 53) states that astronomy began in Greece with the observation of the stars and the planetary movements. The most important of the astronomers were Aristyllos and Timocharis. They established themselves early in the third century BC in Alexandria. However Ptolemy does not mention them in any of his astronomical works. Sarton also states that it is a probability that they used simple equipment, such as gnomons, sundials and planetary spheres, to arrive at their conclusions. Timocharis used these instruments to calculate the precession of the equinoxes which was slightly more accurate than Ptolemy.

Although these astronomers were Greek, it remains highly unlikely that they practised their field in Alexandria. Aristarchus was a contemporary of Timocharis (3-1BC) and it remains uncertain if he was a pupil at Athens or at Alexandria. His date of birth is also unknown but what is certain according to Sarton (1959: 54) is that he was present for the summer solstice of 281. Aristarchos wrote a treatise on the *Sizes and Distances of the Sun and Moon* (Sarton: 55). However it begins with certain hypotheses, which are:

1. The moon receives its light from the sun;
2. The earth serves as a central point to the cycle on which the moon travels;
3. When the moon is at half phase, then the circle which divides the dark part from the light part depends on the direction of the human eye;
4. At the time of the half moon, the distance from the moon to the sun is equal to 87 degrees;
5. That during an eclipse, the breadth of the earths shadow is the same as that of two moons;
6. The moon subtends 2 degrees of one sign in the zodiac.

Aristarchus had a reasonably good method of calculation but his one problem was with observation, which led to his miscalculations. He concluded that the diameter of the sun is equal to nineteen times that of the moon, that the sun is about 311 times the size of the Earth, and that the Earth's diameter is 2.85 times that of the moon. Sarton (1912: 54) states that these were of course assumptions, because while their beliefs of such occurrences are relatively logical, they were incorrect.

In simpler terms, Aristarchus placed the sun as the centre of the universe and made the assumption that the Earth rotated around its own axis on a daily basis while it had rotated around the sun on a yearly basis. All the planets circled around the sun except for the moon, which revolved around the Earth. The stars were fixed and their movements were a mere illusion caused by the Earth's rotation around its own axis, in an opposite direction. This, however absurd as it may seem, did lay the foundation for future astronomers.

However, these calculations and theoretical observances are important in relation to the comparative calculations in the *Surya Siddhanta*. But to establish a better knowledge Ptolemy's *Tetrabiblos* is of more importance.

Astrology in ancient Greece was celebrated and practiced by the elite. It was known as a source of knowledge as it depended largely on the science of the planets. Barton (1994b: 32) states that star worship for instance became submerged in the notions of astrological influence and this problem also occurred in regard to astrology and astronomy in the ancient world. In ancient Greece astrology was classified as an art and was placed among categories which included religion and magic. Ptolemy in his *Tetrabiblos* attempts to change this by incorporating the effects of the planets and providing us with some science to make astrology seem more valid.

Chapter Four: Ptolemy's *Tetrabiblos*

The first of the four books of Ptolemy's *Tetrabiblos* begins with the argument that the idea of pure astronomy is more desirable than that of astrology (*Tetra* bk 1:1964). However Ptolemy also states that astrology is very useful and names the characteristics of the planets and the fixed stars within the context of natural philosophy. Ptolemy also states that he prefers the tropical zodiac to the sidereal zodiac. The former relates to time between consecutive equinoxes consisting of 365 days, 5 hr, 48 min, 46 sec of mean solar time. The tropical year is the basis of the year used in the Gregorian calendar. The sidereal year consists of 365 days, 6 hr, 9 min, 9.5 sec of mean solar time. It is twenty minutes longer than the tropical year because of the precession of the equinoxes; for this reason, the sidereal year does not stay in step with the seasons. He uses the familiarisation concept in an attempt to explain the modes of rulership in terms of science—domicile, exaltation, trigon, bound (see glossary for the meanings of these terms). Ptolemy ends Book 1 by providing a description of the planets according to its quality and power.

In Book 2 Ptolemy focuses on the outer atmosphere and the transmission of planetary movements through it. Ptolemy states that planets have souls and are self moved. However the bulk of Book 2 deals with mundane or universal astrology or events that affect countries, cities or large groups of people. The central aspect of this book is based on natal astrology and concerns the study of eclipses and their ruling planets. Ptolemy uses the trigon ruler of the eclipse to determine the time at which the event will occur and the region at which it would occur. He states the predictions for climates, which he bases on natural signs and meteorological phenomena.

In Book 3 Ptolemy discusses the birth chart and the conception chart. He describes the life the individual will have, based on various factors including the location of the birth, the

ruling planet at that time over that region and so on. It also involves topics concerning siblings, parents, twins, disease, quality of soul, life expectancy as well as strange births.

In Book 4 Ptolemy investigates the type of events that affect the individual after birth. These events include wealth, material fortune, honours, rank, marriage, travel and even the type of death. Ptolemy ties together the first three books in a concluding manner, starting from the seven ages of man then by using the five universal significators of the birth chart to make his assumptions.

4.1 The Concepts in Ptolemy's *Tetrabiblos*

Ptolemy of Alexandria (fl. 130-170AD) wrote the *Tetrabiblos* or 'the four books' in order to give a scientific explanation to astrology of that period. Ptolemy begins the first of the four books by arguing that although the pure study of astronomy remained highly desirable by the intellectually inclined, there always existed another area beyond that dimension—the discovery and configuration of the influences that the heavens have upon the earth and its inhabitants (Whitfield: 2001: 55).

Ptolemy states the effects that the heavenly bodies have on life on earth—including natural phenomena like the tides, the seasons, the climates, the germination of seeds—are determined by the position and movement of the sun and the moon. He creates a logical argument where he states that if the sun and the moon can be influential in natural cycles then so too can the smaller elements in the universe. Ptolemy raises the question, 'Can he not, with respect to an individual man, perceive the general quality of his temperament from the ambient at the time of his birth; as for instance that he is such and such in body, and such and such in soul, and predict occasional events by the fact that such and such ambient is attuned to such and such temperament and is favourable to prosperity, while another is not so attuned,

and is conducive to injury?' (*Tetra* bk 1.2:p13). The ambient, which simply refers to the environment as Whitfield (2001: 55) states, is created to impress a certain character or quality upon each individual at the moment of birth. Ptolemy emphasises that all the seeds of a certain group whether it be man, animal or plant, are generically the same. Among the influences that create the ambient, the stars and planets are raised above any other. There exist the fundamental physical laws that link the stars, the earth and all life on earth—these laws become the subject matter of astrology.

In Ptolemy's thought there was definitely a link between the heavens and mankind. This idea is based upon the doctrine of the four elements, which permeate the structure of nature. They may be described as animate; they are real meaning, in that they have motion, or inanimate; they are imagined and remain lifeless and may have evolved from the dust of the earth to the planets in the sky. The elements to which Ptolemy is referring are earth, air, fire and water. These elements contain characteristics of their own: they are hot, cold, moist, and dry. Some proportion of these elements exists within all forms of nature, including man.

According to Whitefield (2001:56) Hippocratic and Galenic medicine taught that man's bodily constitution might be analysed using these qualities as they manifested themselves in the body, in which case they were known as 'humours'. The first two humours, which were fertile and active, contained the qualities of the hot and moist—while the next two were destructive and passive—the cool and the dry. Not only do these reflect the qualities of the planets, but also bestow these characteristics onto individuals, depending of course on their bodily constitution. These humours helped in the explanation of an area of science known as physiognomics. Barton (2005: 95) defined this discipline as the subject that uses the individuals outer features in order to determine their inner qualities i.e. personality, life circumstances and destiny. This area also pertains to the concept of individual human difference later on. The humours are comparable to the idea of *Gunas* in Vedic astrology,

which is based on a similar ideology describing the effects of the bodily constitution of an individual which determines the outcomes of his/her disposition in life.

The stars and planets in the heavens shared these qualities with man. These qualities spread through the universe, taking the physical form of light rays on the earth. The sun was hot while the moon was moist, Saturn was cool while Mars was dry and burning, Venus was moist and Jupiter remained moist and hot. However Mercury was the only mutable planet as it was sometimes moist and sometimes dry. The rise and fall of the planets in the heaven and their movement through the universe would pass through the key positions in the horoscope which resulted in the magnification or weakening of those born under the rule of the planets concerned in a continuous cycle (Whitfield 2001: 57).

In this discussion, Ptolemy presents the *Tetrabiblos* not as a mythical text but as a scientific one. The reason for doing so was to demythologise the concept of astrology—the gods are gone, for Venus or Mars are no longer considered as responsible for the fate of man (these were the deities who were said to foster love and war in the world of man). It was rather the planets which were responsible, as they are the elements that radiate energy, the same way they radiate light. The *Tetrabiblos* is an attempt to provide rational, scientific foundations using the details of astrology to secure a logical explanation. Throughout the *Tetrabiblos* Ptolemy uses the Greek word *alogon*, which means unaccountable or irrational implying that although he was aware that astrology contained much superstition with no plausible reasoning, he focused on those concepts, which could be explained in terms of physical and causal effects.

Ptolemy, however, believed that there existed certain powers from the outer atmosphere of a like and invisible nature, which are distributed over and penetrate all the changeable substances around the earth. But this idea—that the stars and planets were not capricious gods but rather components in a cosmic order — was not created by Ptolemy

himself, for it was a concept accepted by many Greek thinkers. The characteristics that were given to the stars and planets were that they were probably animate and intelligent and most likely held a subtle but pervasive influence over the earth and mankind. Ptolemy based astrology on these natural principles in his *Tetrabiblos*. These principles agreed with both the best scientific and philosophical tenets of that time.

The fixed stars too shared the same qualities as the planets and therefore exercised a similar influence. However these powers are in no way related to the images of the constellations of the Bear, the Hunter, or the Eagle, for each constellation is further divided into five parts, each one with its own quality. These parts were known as *horia* meaning boundaries. These *horia* could be compared to the concept of decans (see glossary), but Ptolemy tends to reject the existence of decans (Whitfield: 2001: 56). The reason for this was that Ptolemy was an Alexandrian and therefore understood the Egyptian idea of astrology. He also rejects the notion that each degree of the ecliptic has its own influence being either beneficent or maleficent. Instead Ptolemy assigns similar properties to the *horia* in a way that they are given the properties of hot or cold, passive or active, and maleficent or beneficent. The term given to these subdivisions is *termini*— a Latin word. However these characteristics were soon caught up in the horoscope. Whitfield (2001: 57) states that it is possible that these divisions represented the twelve-fold zodiac, which may have been subject to the lordship of the ruling planet similar to the way the days of the week are named after the planetary gods.

4.2 The Horoscope of Nations

In astrology there is a special branch which relates to the horoscope of nations. It involves the position of the country/state or group of people affected, in relation to the planetary movements. Ptolemy also mentions this aspect in the *Tetrabiblos*.

The bulk of the *Tetrabiblos* is filled with Ptolemy's understanding of the relationship between the heavens and the earth. Concerning the geographical aspect, Ptolemy consults the planetary positioning in relation to the zodiac at any given moment. He does this in order to establish the effect of the zodiac on a specific nation.

However, it is not only the position of the zodiac that determines the outcome of a nation. Ptolemy mentions the importance of eclipses in the prediction of the events that might either be maleficent or beneficent towards a specific nation. In Book 2 Ptolemy gives a full explanation as to the effects of eclipses on mankind, but he does not give a scientific explanation as to the cause of the eclipse itself.

What he does advise, however, is the observance of the colours that are visible in the night sky at the time of the eclipse. This may include the colours of the luminaries themselves or the formations that may occur around them such as halos, rods and the like (for these terms see the glossary). For if they appear black then the events will follow the tidings of Saturn, if they appear white then they would follow Jupiter, if they are reddish then they have Mars as their leader, if they are yellow then Venus bestows her traits upon them, but if they are varied then they have the mixed blessings of Mercury. Now the most important observation according to Ptolemy is if the whole body of the luminary is coloured or if just a part of it is coloured. If the whole body is coloured then the predicted event will affect most parts of the countries involved, however if just a part of the luminary is coloured then only a small region will be affected.

The main argument of many of Ptolemy's critics is that while he tends to draw these conclusions, he does not give any rational basis for these links. For example Ptolemy does not state why Europe is governed by the triplicity of Aries, Leo, and Sagittarius, or why Africa is ruled by Cancer, Scorpio, and Pisces. But what does emerge from all of this is that Ptolemy

bestows more power to the planets than to the signs of the zodiac throughout the *Tetrabiblos* (Whitfield 2001: 68).

4.3 Astrology and Medicine

In the *Tetrabiblos* Ptolemy once again gives power to the planets. He assigns parts of the human anatomy to the rulership of the planets. For the most important parts of the human body, Saturn is the ruler of the right ear, the spleen, the bladder, phlegm, and the bones. Jupiter is lord of touch, the lungs, arteries, and the seed. Mars rules the left ear, the kidneys, the veins, and the genitals. The Sun is the ruler of sight, the brains, the heart, the nerves, and all the right side. Venus is the lord of smell, the liver, and muscles while Mercury governs speech and thought, the tongue, bile, and the buttocks. The moon is the last mentioned and is lord of taste, drinking, the mouth, the belly, the womb, and all the left side (3.12.319). Ptolemy explains this by stating that injury may occur to an individual when the significant maleficent planets are oriental or towards the east. An example is that blindness in one eye may occur as a result of the moon being directly on the angles of the zodiac, or when it is in conjunction with other planets, or is in its full phase, and when it is in another aspect that bears a relationship to the Sun, or one of the star clusters of the zodiac, for example to the Pleiades of Taurus, to the arrow point of Sagittarius, to the sting of Scorpio, or whenever Mars or Saturn moves towards the moon.

But he states that if these planets are in aspect with both the luminaries at the same time then they will affect both eyes. Mars brings about blindness from a thrust or a blow, iron or burning, Mercury would be from a felonious attack, Saturn from suffusion, cold, or glaucoma. If Venus appears on the occident angle and is joined by Saturn or, is at least in aspect with him and has Mars in opposition to him, then men who are born at this time will be

sterile while the women will be subject to miscarriages, premature births or even embryotomies, especially in the phase of Cancer, Virgo, or Capricorn. Individuals who have lisps are a result of Saturn and Mercury being joined at the angles together with the Sun.

While Ptolemy attributes injuries to the presence of maleficent planets, he also attributes the period of healing to the beneficent planets (*Tetra* 3.12.331). He states that if the beneficent planets are in an authoritative position then the injuries caused by the maleficent planets shall not be disfiguring, and do not entail reproach, and diseases will be moderate and can be easily cured. If Jupiter is present then he causes injuries to be concealed by riches or honours, which may lead to the mitigation of the disease. Mercury brings about the aid of good physicians and drugs.

Ptolemy gives us rather lengthy discussions on the symptoms caused by the planets by following his natural law doctrines. However, he also gives a logical explanation in his *Almagest* in which he discusses the concept of the four humours (Whitfield: 2001: 92-93). The Hippocratic School of medicine on the island of Kos followed the ideas of medical astrology and were influenced by the beliefs of Berossus (the father of astrology). The principle doctrine was that the planets altered the balance of the humours in the body and that each zodiacal sign ruled a specific part of the body. The moment of birth determined the degree of influence exercised by the universal elements on each individual making up their bodily constitution. By using this process the illness could be identified. This later became known as *kataarchic* medicine.

4.4 Horoscopic Astrology and the affects on Individual Human Difference

Horoscopic astrology is based on a system using the individual together with the birth sign. On the issue of the individual horoscope Ptolemy in Book 2 accepts that the moment of

conception is important but is often unknown and therefore the moment of birth should be taken. The first is considered to be the coming-into-being of human seed phase and the second is considered to be the coming-into-being of a man phase. Ptolemy states that the astrolabe (see glossary) is essential for the exact determination of the moment of birth (Whitfield: 2001: 93; *Tetra.* 3.12.229).

At the moment of birth a detailed account of the heavenly bodies is taken, whether it be a full moon or a new moon, taking into account both luminaries if it happens to be a new moon. The fixed stars are also taken into the consideration at the time of birth. A rule of domination is created by Ptolemy in his *Tetrabiblos* which he breaks down into five sections: trine, house, exaltation, term, and aspect (see glossary).

The star passes through these forms in time, thereby picking up and giving the characteristics to the individual born at that time, under that particular ruling planet. In Book 3 Ptolemy discusses how these elements affect the characteristic of the individual. It deals mainly with the sex of a child, of twins, of multiple births, of monsters and so on. He also makes a clear statement that predictions cannot be made by lots and numbers, but through the science of the aspects to the stars and their fixed positions at the time of birth.

Each place in the zodiac is assigned a different role, for example the mid-heaven is a place of query for the part of action, or the place of the Sun is an area of query for the father. Next you have to observe those planets that have a relationship of ruler to a place or a specific question. Now, while it may be acceptable that individuals gain their characteristics from the planets and fixed stars that are in cycle, and that the opposing planets create the obstacles that they may experience in their lifetimes, Ptolemy raises the reason for the conception of twins which led to much debate. He states that in the case of twins, two luminaries will appear in the sky which would cover the bi-corporeal signs (see glossary) in conjunction with the ruling planet thus leading to the conception of twins. The sex of the twins or of any child would be

determined by the accordance of the planets relationship with the Sun and moon. If the arrangement of the horoscopic angle is **not present** then it results in the birth of three males, when Saturn, Jupiter and Mars are present. But when the bi-corporeal signs of Venus and the moon are visible then it results in the conception of females. But the different regions expect different results.

The most important aspect of horoscopic astrology is the distance between the related degrees of the zodiac. Ptolemy does not give the exact distances, but states that if the distance of the degree occupied by the ruling planet from that of the general zodiac is greater than its distance from that of the corresponding mid-heaven, then the same number must be used to constitute the degrees of the other angles.

The calculations are merely touched on in the *Tetrabiblos* while a detailed account is in the *Almagest*. The *Almagest* describes the movement of the Sun, moon and planets for which Ptolemy provides a series of explanatory tables and co-ordinates. While the *Tetrabiblos* is a natural philosophy text, the *Almagest* provides us with the mathematical aspects. In the *Almagest* Ptolemy provides us with a detailed account on the *topoi*, or the houses of the zodiac. *Topos*, a term that means places and describes the life, death, family and wealth of the individual, is an area that is only vaguely mentioned in the *Tetrabiblos*. However, in these *topoi*, he divided the earth into different regions or areas. These places were governed by the different zodiacal signs, which also overlap in the area of the astrology of nations. He uses a three-divisional system, which he has detailed out in Book 2 of the *Tetrabiblos*. In his analysis he states the following: the people that live under the southern parallels or latitudes i.e. from the equator to the summer tropic are burned, and have black skins and thick woolly hair, since the sun is directly above them. They are shrunk by nature and have bad tempers. The heat turns them into savage beasts. He is of course referring to the Ethiopians (*Tetra* 2.2.2-3 p58).

Those living under the northern parallels have the constellation of the Bears over their heads, meaning that they are far from the zodiac and direct sunlight so they are cooled and retain moisture. They are white-complexioned and straight haired and rather cold in nature. He considers them as savages too because they are constantly cold. These are the Scythians (*Tetra* 2.2.4 p59). In the middle region that is between the summer tropics and the Bears are the people of medium complexion and moderate stature. Since they enjoy the moderate temperatures then they must have moderate temperaments. They live close together and are 'civilised' (*Tetra* 2.2.6 p60). But he goes further by subdividing the middle region and states that those residing to the more southern regions are shrewd and inventive which makes them more inclined to astrology. Those to the east are more masculine, having strength and resistance as a result of being under the influence of the sun. Those living in the west are rather feminine, softer and more secretive but is careful enough to state that there are exceptions depending on character and customs, which in some way may influence these traits (*Tetra* 2.3.2. p61). He further states that it is important to consider these outer influences when using astrology. Although these may seem like general racial descriptions, they also provide insight into the influences that may have hindered the progression of astrology.

The main problem is to evaluate the degree to which human individual difference became popular in the era of Ptolemy by merely using astrological data. I say this relying on the evidence supplied to us by the discipline of physiognomics and Barton (2005:101) who states that prediction of future events was far more popular than astrology, which may have resulted in Ptolemy's defence against the critics. Physiognomics was not Greek in origin but was introduced to the Greeks by the Mesopotamians in the earlier second millennium BC. Physiognomics detailed the prophetic qualities in respect to the constitutional elements of the human body. The following are examples of how this theory worked: If a man with a contorted face has a prominent right eye, then his eventual destiny would result in him being

killed and eaten by dogs, far from his home. If a man has yellowish lines on his face, then the state treasury would take all his belongings, or only his good furniture, or if a man has curly hair on his shoulders then women would fall madly in love with him. Physiognomics was one of many ways of divining the future, but unlike astrology it did not provide details on individual difference. This implies that people in that time were more interested in immediate answers than on the characteristics of the individual themselves. Therefore I believe that Ptolemy felt the need to present astrology as a pseudo-science so it may be accepted by the population, as having some effect on life on earth and the events that were to occur as a result of this.

4.5 Ptolemy's Seven Ages of Man

Ptolemy institutes a seven divisional system in the life of man. Each age is ruled by a governing planet. His doctrine begins with the rulership of the moon, which rules over the years of infancy until the age of four. Then Mercury assumes leadership as the giver of intellectual development in the childhood years. From the ages of fourteen to twenty-two Venus takes over as the age of the lover. The longest age is the age governed by the Sun; this is the age of young, ambitious manhood ending at age forty-two. Mars rules the next fifteen years followed by Jupiter for the next twelve years and finally comes Saturn ruling in the age of senility before death. Ptolemy claims that it is self evident that the qualities or characteristics of the planets are reflected through the progress of man (*Tetra* 4:437).

He gives a description of these life stages in conjunction with the ruling planet. The moon which rules over infancy is described as changeable, quick in growth which relates to the waxing and waning of the moon. This produces moods of instability of an individual and it is a moist body. Mercury is described as traditional—the age of education. This is the

substance that forms soul and the intellectual personality. The age of Venus contains passion, impetuosity and the unhappiness that springs from love.

The Sun represents the age when man desires glory and wealth. Mars begins with the next age of man and introduces a violent characteristic of man, striving for power and fame. This is the age before his decline. Jupiter rules the age of renunciation of physical labour and the turmoil of ambition. This leads to the ultimate movement towards a more mature judgement of foresight and philosophical detachment. The final years of man belong to Saturn, representing the years of cold and silence and of failing strength and intellect.

The *Tetrabiblos* in modern translation tends to exclude the seven ages of man implying that it is not necessarily important or true for that matter. Whitfield (2001: 64) asks the questions as to where these ruling planets come from. They do not coincide with the periods of the planets' rotations around the Sun and there seems to be no metaphysical justification for them. The solution, however, comes from the classical texts which mention the phenomena of *apokatastasis* which means the return to the original position. Now if we apply it to the motion of the planets, it creates the theory that while on their rather complex path against the sky, they will frequently but periodically be seen against the same background of fixed stars and are measured in the periods of their returns to those exact positions. This corresponds to the calculations of Ptolemy.

The process of *apokatastasis* gives the planetary periods in years, which suggests why the life of man for that period should be under the control of that particular body. This implies that there is a relationship between the microcosm and macrocosm and that these periods of time were built into the revolutions of the heavenly bodies, thus shedding their influence over man in such a way that it seemed as though his life followed a set path and followed the same cycle as the ruling planet.

4.6 Fate and Destiny in the *Tetrabiblos*

Throughout the *Tetrabiblos* Ptolemy never denies the existence of fate or destiny. He does argue in Book 1.3 that we should consider that unexpected events often results in panic and delirious joy while foreknowledge results in the calming of the soul. There is no reason as to why separate events should attend mankind as a result of the motions of heavenly cause as if they had been originally ordained for each person by some divine command or destiny. He states that the truth of the matter is that the movement of the heavenly bodies is eternally performed in accordance with the divine, unchangeable destiny while the change of earthly things is subject to a natural and mutable fate and that it is governed by chance and natural sequence. And while some things happen to men through very general circumstances and not according to the individuals own natural endowments — as when because of great and inescapable changes in the heavens, men die in great numbers by fire or plague or flood, other events happen because of small and chance antipathies in the heavens (*Tetra* 1.3.23).

If what is going to happen to man is not known then it is bound to follow the sequence that is dictated by its original nature, whereas if it is foreknown and provided with a remedy it does not happen at all or it becomes considerably modified. By explaining destiny is such a matter of nature Ptolemy still manages to maintain astrology's integrity. He also allows room for flexibility in the way that events actually occur on earth.

The problem of mutability of fate was one which accompanied astrology from its beginnings and is reflected in the legend of Alexander the Great which first appeared in the time of Ptolemy. The legend tells of how the soothsayer Nectanebus had told Olympias to prolong the birth of Alexander until an auspicious and fortunate moment had arrived in the heavens. This would ensure the success of the young prince. The tale remained unhistorical

until the second century AD when the question was raised as to whether man could influence his own destiny in this manner or whether such a manipulation was just an illusion.

The main question, however, is whether everything or every event that had occurred was predetermined by a hidden chain of causes from which man could not escape. Ptolemy does not give a direct answer to these questions but merely states that natural phenomena are partly responsible. He also says that much of this issue on destiny depends not so much on the circumstance or chance but rather on the temperament of the individual.

The *Tetrabiblos* draws reasonable conclusions from identifiable sources but it does not mean that all of his beliefs or explanations were fixed and agreed upon, but it does show that astrology was given the recognition of being of some importance in that it did engage the minds of the intellects giving much rise to debate.

4.7 In Defence of the *Tetrabiblos* against the Critics

While Barton (1994: 163) may refer to the *Tetrabiblos* as a work of conjectural art and Whitfield (2001: 53) states that the *Tetrabiblos* was the basis for science and astrology, not all scholars agree. The famed French philosopher and mathematician Pierre Gassendi (1592-1655) dismissed any truth behind astrology. Whitfield (2001: 57) states that Gassendi believed that true knowledge of nature came only through the senses and that the astral influence was an unproven phantasm, and this included other metaphysical philosophies as well. Gassendi said that astrologers did not observe the heavens themselves but instead relied on second hand information including the use of inaccurate tables. Gassendi also claimed that there might have been two Ptolemies—on the author of the mathematical *Almagest* and the other the author of the false and credulous *Tetrabiblos*.

A.A Long (quoted by Barnes 1982: 182) says that the *Tetrabiblos* or rather the bulk of information that it contains is based upon rhetoric and dialectic. Long asks us to consider the situations of sailors, farmers, laymen and animals whose experience of the heavenly activities including analysing the weather should be a fallible source for predictions. 'But if man knows precisely the times and places of all celestial movements and if he knows at least such potential effects as the Sun's heating and the moon's moistening and if he is capable of distinguishing the specific quality resulting from the medley of everything, then what is to prevent him from being an infallible weather forecaster? . . . Why too should he not be able to perceive the general quality of an individual's ambient from the state of the heavens from the time of his birth? For instance his generic type in body and in soul and why should he not be able to perceive what will happen to him at given times?' What Long is implying is if he can predict the weather by way of observing the heavens then surely he can predict other events as well.

However, Ptolemy remarks that the possibility of astrological knowledge is established by such considerations. He makes a number of disclaimers. Firstly he grants the inexperienced astrologer the belief that even correct predictions rely upon chance. Secondly that astrology has been besmirched by vulgar soothsaying. But he also says that even the expert is bound to make errors (*Tetra* 1.2.14-15). This is due to the magnitude of the undertaking as well as the approximate relationship between the ancient configurations of the planets which formed the basis of the ancient records and the current state of the heavens.

But with all the little contradictions in the *Tetrabiblos*, Ptolemy continues his defence on the scientific explanation by disclaiming total causal efficacy for the findings of astrology (*Tetra* 1.2.16-19). It is his opinion that the state of the heavens is the most powerful at the moment of birth, as a result of numerous contributory factors such as genetics—a horse begets a horse, a man begets man and so on. This is of course performed under the same

celestial conditions. He says that in spite of its fallibility astrology is a divine art and should be appreciated by its practitioners. In 1.3.20-23 of the *Tetrabiblos* Ptolemy claims that astrology is useful in that it gives the mind foresight to the future and once more that knowledge has a practical application to an individual's bodily constitution. The criticism of astrology being superfluous fails to recognise that this foreknowledge of events makes for mental health by inducing a sense of equanimity, but his best defence draws on the earlier admission that astrology does not establish complete and absolute causal laws. Celestial causes are not irrevocable divine orders so that no other cause can counteract them.

Concerning the difference between the immutable heavens and the changeable nature of earthly things, celestial movements provide only first causes. These are in the form that such and such will happen if nothing contrary counteracts. First causes necessitate effects only if nothing stronger intervenes. Therefore on the basis of celestial conditions operative at someone's birth, in conjunction with that person's constitution, an astrologer may predict a disease if no natural preventative measures is taken.

The thesis that astrology identifies pre-disposing conditions enables Ptolemy both to defend its utility as quasi-medicinal and to meet the objection that its predictions undermine human precautions. The astrologer does not advance generalisations, but gives reasons for expecting certain occurrences. As to the supposed difficulty of vast numbers perishing at the same time, Ptolemy takes the occurrence of natural or human disasters to show the celestial causes of general effects are always more powerful than those which affect individuals in isolation (*Tetra* 3.1.118-119).

Following this he explains the astrology of nations and individual births. It seems that with all the criticisms Ptolemy has formed a rather lengthy but logical rebuttal by using the natural principle to establish a grounding for the existence of astrological and astronomical

phenomena. However the strength of his defence was the fact that he did not claim to be right but merely explored the effects of nature on the life of man.

Chapter Five: The Astrology of Ancient India

The ancient Indians believed in many aspects of human and divine nature, and therefore willingly regarded astrology as part of their religion and culture. Any such belief was therefore considered rational. The worship of the sun and moon was presumed logical, because of the 'Karmic Doctrine' of rebirth and the concept of the *Gunas*.

In ancient India the theory of astrology may have originated in a religious rather than a scientific context. While it may be assumed that the Indians did not fully understand the scientific reasoning behind astrology it has been mentioned in the *Rig Veda* that is dated around 2000 B.C., although chronological exactitude is notoriously difficult to establish in Indian religion. The argument is that while Indian civilisation is considered to be one of the oldest civilisations in the world its recorded history remains minimal. It is however considered to be as old if not older than the Sumerians and on the same level in subjects such as mathematics. The system of astrology that was known to the ancient Indians was *Jyotish*, which was found in the *Vedas*. *Jyotish* means 'the science of light' or 'the wisdom of the heavens'.

5.1 The Age of the Vedas

The Age of the *Vedas* is based on an article by Rajesh Kochhar (1999: 171-197), as well as the *Vedas* of ancient India. In this paper Kochhar states that the starting point of Vedic astronomy can be found in the *Vedas* of which the *Rig Veda* is the most important. However there are also other subordinate texts which support the ideals and theories expressed in the *Rig Veda*. There was one text often overlooked by modern scholars which gave much insight

into Indian astronomy. It was known as the *Vedanga Jyotisa*. More recently it has been incorporated into the body of the *Vedas*.

The people of India drew their conclusions from the theory of 'seeing is believing.' The *Rig Veda* makes a number of comments on the various aspects of nature. The *Rig Veda* (10.161.4) refers to the year as being represented by the changing of seasons. And throughout this text the planet *Brihaspati* is mentioned. However what remains uncertain is whether the connection between *Brihaspati* and modern day Jupiter had already been made.

Brihaspati was referred to as the regent of the *Nakshatras* equivalent to the *Delta Cancri*. The *Rig Vedic* year consisted of 12 months, each of 30 days, which gave a total of 360 days in a year (*RV* 1.16.4.48). However the modern year consists of 365 days in a year. While a month is calculated from one full moon to the next equals to 29.5 days. This meant that the lunar year was made up 12-13 months in one year. To amend this discrepancy the *Vedanga Jyotisa* added two months in a period of five years containing 62 lunar months or 1830 days. But this again gave an inaccurate number of 366 days in one year.

5.2 The Concept of Time

The *Surya Siddhanta* claims that the time that had elapsed prior to its existence had been 2, 164,960 years (Burgess 1859: 146). Time is measured in the ages or *Yugas* which is estimated to about 4,320,000 years. However there are some changes in each period of time, depending on the motions of the heavenly bodies. What is important to note is that the *Surya Siddhanta* is written in verse and is a religious text, hence it may be scientifically inaccurate.

The idea of time is based on two levels in the *Surya Siddhanta*, the first being *murta* or real time and the second being *amurta* or unreal time. Burgess (1859: 148) translates point ten of the verse which states, 'Time is the destroyer of the worlds, another time has for its nature

to bring to pass. The latter, according to its gross or minute, is called by two names, *murta* and *amurta*.' This literally means that as with all civilisations there exists a cycle of birth and death, however the Indians related it more to Death and again bring in a sense of myth and religion when relating this back to *Yama* or the God of Death. This then relates back to the concept of fate and destiny. Time is measured by using the Sidereal day. It requires establishing the period of which the earth spins on its axis.

5.3 The Yuga System (The Ages of Man)

This subsection refers to the different time periods, similar to the eras of life on earth, however it also bestows certain characteristics to those people born during these times which is discussed later in this section.

The term *Yuga* denotes vast stretches of time in Indian astronomy and astrology. This was not a fixed unit of time but any time span that was associated with a recurring phenomenon. The *Rig Veda* (1.158.6) refers to this age. It uses the sentence 'Dirghatamas having grown old in the tenth *Yuga*.' Kochhar states that this probably referred to the age of man, which in the lifetime of man is estimated to be of a period of between five to ten years.

However the *Artharva Veda*, a branch of the *Rig Veda*, uses the ages of *Yuga* throughout the text. It actually referred to the number of divine years in the *Vedic* religion. The *Yugas* represented the four ages *Krta*, *Dvpara*, *Khara (treta)* and *Kali*. The sages of India considered by consulting the heavens that the age of *Krta* to be the best years—years of goodness, peace and prosperity, while the present age, that of *Kali*, is considered the worst age of man. This age is an age of war, destruction and degenerate souls. The precise calculations of these ages were unknown and still are.

The *Surya Siddhanta* states the same idea but in his translation Burgess tries to analyse the text more carefully. The names of the ages remain the same which means that both Kochhar and Burgess relied on a similar source of information. However Burgess (1859: 1.17) states that the difference from one age to the other is provided but is difficult to estimate in logical terms because in the *Surya Siddhanta* it is calculated in divine years. But Burgess then relates these ages in comparison to eons. These ages are compared to the Greek equivalents of Golden age (*krta Yuga*), the Silver age (*treta Yuga*), the Bronze age (*Dvpara Yuga*) and the Iron age (*Kali Yuga*). In total they add up to the one Great Age of man.

Age	Divine Years	Solar Years
(Golden Age) (<i>krta Yuga</i>)	4 800 years	1 728 000
Silver age (<i>treta Yuga</i>),	3 600 years	1 296 000
Bronze age (<i>Dvpara Yuga</i>)	2 400 years	864 000
Iron age (<i>Kali Yuga</i>).	1 200 years	432 000
Total= Great Age	12 000 years	4 320 000

Figure 1: The Ages of Man in the *Rig Veda*

As seen in figure 1 the first age is the longest age and is defined in the *Surya Siddhanta* as the age of 'winners', the next two ages are shorter but not much is mentioned about them in the text. The last age (the present age) is the shortest and is termed as the 'unfortunate age'.

5.4 The Twenty Seven Fold Zodiac of the Vedas

The ancient Indians used the system of a twenty-seven fold zodiac, which basically meant that their zodiac consisted of twenty-seven signs. The word *Nakshatra* literally means star in Sanskrit. It begins on the 13th or 14th of April in the sign of *Ashwini*. The reason for the twenty-seven fold zodiac is that these signs were considered to be the twenty-seven wives of the Moon God Soma in Hindu mythology. The astrological aspect behind it was that these planets played a passive role and it is believed that when the Sun God (*Surya*) travels through the universe, he visits the twenty-seven wives of the Moon God. This creates the differing aspects of human nature—its desires and changing moods. This establishes the personality of an individual at the time of birth. The twenty-seven signs were governed by the *nava grahas* or nine planets. The planets were *Shukra* (Venus), *Mangala* (Mars), *Brhaspati* (Jupiter), *Shani* (Saturn), *Buddha* (Mercury), *Surya* (Sun), *Soma* (moon) and the shadow planets (see glossary) of *Rahu* and *Ketu*. *Rahu* and *Ketu* were the nodes of the moon where the points of astronomical phenomena could be seen (*RV* 1.68.4).

Vedic astrology was based on the system of observable astronomy; it was based on those aspects of universal change that could be seen through the naked eye. Uranus, Neptune and Pluto were not visible in the pre-telescopic era in India. And so these planets were not included as part of the *nakshatras*. The idea of the three decans is systematically done but not for the obvious reason. One might assume that that since there are nine planets, then the twenty-seven *nakshatras* is merely divided into three signs per ruling planet, however the question that arises is that how did the Vedic Indians know that these *nakshatras* were governed by nine planets. I say this for the following reasons: there were only seven visible planets but they then created the ‘shadow planets’ of *Rahu* and *Ketu*. Secondly there were initially twenty-eight signs in the Vedic zodiac, which would mean the division of these signs

would result in the exclusion of one sign. A true explanation may be given in the next subsection on the positions of the asterisms.

5.4.1 Positions of the Asterisms

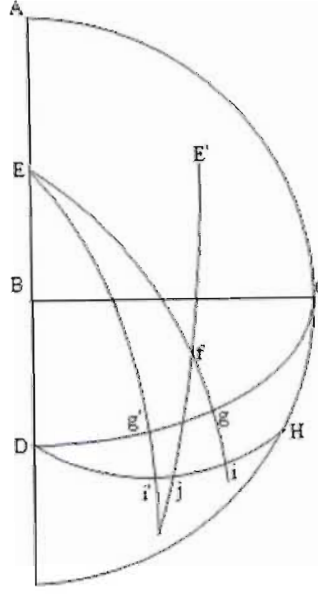


Figure 2: Diagram representing the calculations of the asterism positions

In figure 2 let BC represent the equator and HD represent the ecliptic, with E and E' as their respective poles. Let f be the position of any given star and draw the circle of declination Efi through it. This means that i is the point on the ecliptic of which the distance from the first sign of Aries and from the star f are given as its longitude and its latitude. Latitude (*vikshepa*), meaning 'disjection', is the amount by which any body is removed from the declination which it ought to have originally had. This means that that this is from the point of the ecliptic which it ought to have originally occupied. Regarding the case of a planet, its proper path remains in the ecliptic and the point of that circle which it ought to occupy is determined by its calculated longitude. In regard to the fixed star, it is important to note that its only motion is around the pole of the heavens and its point of declination is that to which it is referred to by a circle through that pole. Therefore, in figure 2, the declination of f i.e. the fixed star would

either be g or i , or the distance from i to the equator at g . Its latitude remains at if or its distance from i . However, when designating the positions of longitude of i , the term *dhruva* is used in the *Surya Siddhanta* (Burgess 1859: 320, viii), which means fixed or immovable. This *dhruvra* refers to the polar longitude and *vikshepa* as polar latitude. Using this diagram an explanation may be given as to the positions of the asterisms and as to why there are twenty-seven signs in the Vedic zodiac. It depends on the idea of *dhruva* which also means fixed in Sanskrit. It is measured in minutes or arcs and each portion is estimated to be around $13^{\circ} 20'$. So each asterism is actually $13^{\circ}20'$ apart. Each asterism takes its name from the ruling divinity while the total of the minutes equals to twenty-seven hence the twenty-seven fold zodiac, but in order to do this the longitudes and latitudes had to be calculated first.

5.4.2 Names of the Asterisms and their Characteristics

<u>Name of Vedic Asterisms</u>	<u>Stars compared</u>	<u>Characteristics</u>	<u>Ruling Divinity</u>	<u>Western constellation (modern estimation)</u>
1.Ashwini	β Arietis	The dual signs of the Ashwin brothers, who in Hindu myth are regarded as the astral horsemen or guardians of the universe. They are similar to the Dioscouri in Greek myth i.e.Castor and Pollux.	The Ashwins	Aries, represented by the Ram.
2.Bharani	β Arietis	Depicts plurality, meaning bearer away and is represented by the belly of the ram.	Yama, the God of the underworld.	Aries
3.krittika	η Tauri	Represented by a razor,and means to cut or challenge.	Agni, the God of fire.The group is composed of six stars also known as the Pleiades.	Taurus, the Bull
4.Rohini	The Arab, Aldabaran	Meaning ruddy or dark orange, represented by a temple.	Prajapati, Lord of all created beings. Consists of five stars known as Hyades, containing $\epsilon\delta\gamma\theta\alpha$ Tauri.	Taurus

<u>Name of Vedic Asterisms</u>	<u>Stars compared</u>	<u>Characteristics</u>	<u>Ruling Divinity</u>	<u>Western constellation (modern estimation)</u>
5.Mrigisira	λ Orionis	Represented by the head of the antelope.	Soma, the Moon God. It contains three stars of which the Northern most is the determinative.	Gemini, the twins.
6.Ardra	α Orionis	It is the brightest star in the right shoulder of the constellation of Orion. Represented as a Gem.	Rudra, the storm God. It is the only star.	Cancer, the crab
7.Punarvasu	β Geminorum	Meaning good or again.	Aditi, mother of the Adityas- symbolising the Sun. Consists of two stars.	Cancer
8.Pushya	δ Cancris	Meaning auspicious, or prosperous. Represented by a crescent and an arrow head.	Brihaspati, the priest and advisor to the gods.	Leo, the lion.
9.Ashlesha	ϵ Hydrae α Cancris	Meaning entwiner or embracer.	Sarpas, the serpents.	Leo
10.Magha	Regulus	Meaning the mighty.	The Pitaras, the Fathers. The names of the departed.	Cusp of Leo and Virgo.
11.Purva Phalguni	δ Leonis	A dual sign with U.Phalguni, represented by a bed or couch.	No mention.	Virgo
12.Uttara Phalguni	β Leonis	Bed or couch.	No mention.	Virgo
13.Hasta	γ Corvi	Meaning hand.	Savitar or the Sun.	Libra
14.Chitra	Spica	Meaning brilliant.	Tvashtar, the shaper or moulder of life.	Libra
15.Swati	Arcturus	Meaning sword.	Brahmana, the sages.	Scorpio
16.Vishakha	α Librae	Meaning to spread branches.	Dual divinities of Agni, God of fire and Indra, God of the sky.	Scorpio
17.Anuradha	δ Scorpionis	Meaning successful.	Mitra, friend of the Adityas.	Scorpio and Sagittarius
18.Jyeshtha	Antares	Meaning oldest.	Indra, God of the sky.	Sagittarius
19.Mula	λ Scorpionis	Meaning root.	Nurti, God of calamity.	Capricorn
20.Purva Ashadha	δ Sagittarii	Twin asterisms of the unsubdued.	Apas and Devas, who are collective gods and rulers of the seas.	Capricorn
21.Uttara Ashadha	σ Sagittarii	As mentioned above.	Apas and Devas.	Capricorn and Aquarius
22.Abhijit	Vega	Meaning conquering and is represented by a triangle.	Brahma, the creator of all living things.	Aquarius
23.Shravana	α Aquilae	Meaning to hear.	Vishnu, the God who strode heaven.	Aquarius

<u>Name of Vedic Asterisms</u>	<u>Stars compared</u>	<u>Characteristics</u>	<u>Ruling Divinity</u>	<u>Western constellation(modern estimation)</u>
24.Dhanishta	β Delphini	Meaning most famous. It has elements pertaining to wealth.	The Vasus, god of all good.	Pisces
25.Shatabishak	λ Aquarii	Meaning having a hundred physicians.	Varuna, god of the Adityas, and of water.	Pisces
26.Purva Bhadra	α Pegasi	Meaning beautiful or happy. Forms a joint star with Uttara Bhadra. Symbolised by twins.	No mention.	Aries
27.Uttara Bhadra	α Andromedae	As mentioned. The latter or more evolved.	No mention.	Aries
28.Revati	β Andromedae	Meaning wealth or abundance.	Pushan, one of the Adityas. God of prosperity.	Aries

Table 1: Names and characteristics of the asterisms

Taking a closer look at the table, we will notice that there are twenty-eight constellations instead of twenty-seven. The reason for this as stated by Burgess (1959: 323, viii, 9) is that the table was probably drawn up at the time of the vernal equinox and the period that it actually coincided with the initial point of the Hindu sidereal sphere—this marked the beginning of the sign of *Ashwini*, the point 10 degrees eastward on the ecliptic. The term junction-star refers the fixed star or the most prominent star in a group of stars. This one junction star represents the entire group or asterism. The twenty-eight fold zodiac was then divided into 28 arcs inside the circle—and each measuring approximately 12 degrees. This later changed to just over 13 degrees with the omission of the twenty-second asterism of *Abhijit*. However this did not mean that the sign or rather the constellation disappeared entirely, it was incorporated into the zodiacal sign of *Purva Ashadha*. The other reason may have been that the Vedic zodiac was aligning itself with the western zodiac, and that is why in

the table you will only find one Vedic sign in that of Gemini i.e. Mrigisira. In modern Vedic astrology the sign of Ardra also falls under the western sign of Gemini.

5.5 Fate, Destiny and Human Difference in the Vedas

Karma is the main doctrine of the well-being of all life on earth. It is based on the simple theory of every action having a consequence, and in Indian culture the result of karma is dependant upon past life deeds. The resultant force of karma is either good or bad. While philosophers may disagree on the issues of fate and destiny I believe in freewill. However as anything in nature, there always exists a series of events that create a chain reaction. This does not prevent or hinder the individual in any way from making the relevant decisions affecting his/her destiny.

In Vedic culture, the planets are said to regulate the consequence of karma upon life forms on earth. The planets by themselves do not possess any independent ability to confer or take away benefits from an individual. The life that an individual lives is predestined in a play and the role that each one is given has to be enacted as part of their karmic ties. The planets are the nine dials of the earth clock that mark time as well as describe events that happen at every moment. These dials refer to the nine planets – each bestowing its own characteristics to the individual born under their rulership. Each of the nine parts symbolize a set of principles and characteristics, the coalescence of which give rise to the multiple thought processes in individuals, that in turn transform into actions that lead to events. The planets too are viewed as conscious entities with the physical planets themselves being merely their material forms. A planet is referred to by the Sanskrit name *Graha*, which means something that binds you to your current disposition.

The doctrine of Karma and reincarnation play an important role in the concepts of Fate and Destiny in the *Rig Veda*. This is known as the *Rnanu Bandhanas*, which bind us to this earth. The ruling planet determines the deeds of our past lives at the time of our birth. *Rahu* and *Ketu* are the *chaya grahas* (shadow planets) and form an important part in the fate and destiny of the individual. Since they are points of ecliptic activity, they obstruct the light from the Sun and moon creating shadows. After the darkness emerges a new light, thus representing the cycle of rebirth and of the process of life. The sun represents the soul while the moon represents the mind or intellect. The eclipse results in regeneration, transformation and change.

Although these concepts of fate and destiny are marked by these Karmic ties it does not mean that an individual cannot improve his/her current situation. This doctrine implies that while some aspects of one's fate and eventual destiny cannot be changed in accordance with the *Rnanu Bandhanas* other areas can be improved.

5.6 Eclipses in the *Surya Siddhanta*

In Hindu mythology it was believed that the gods and the demons once formed an alliance to produce nectar that could give them immortality. This is the story of the churning of the milk-ocean and the descent of Lord Vishnu as the *Kurma avatara*, otherwise known as the divine tortoise. When the nectar that was finally churned from the ocean and was about to be served to the gods, a demon, disguised as a god, sat between the Sun and the moon in an attempt to taste the nectar. When he was discovered by the Sun and the moon, Lord Vishnu immediately severed his head from his body. Unfortunately, the demon had already tasted the nectar, thereby obtaining immortality. Since then, this demon wreaks vengeance on the Sun and

moon whenever they come near. The head of this great demon is known as *Rahu* and his tail is known as *Ketu*.

In Hindu astrology *Rahu* and *Ketu* are known as two invisible planets. They are enemies of the Sun and the moon, who at certain times of the year, during conjunction or opposition, cover the light of the Sun or the moon causing either a solar or a lunar eclipse. In Sanskrit this is known as *grahanam* or seizing.

Although it is rather difficult to grasp in logical terms, it actually describes the process of an eclipse accurately. *Rahu* and *Ketu* are the astronomical points in the sky respectively called the north and south lunar nodes.

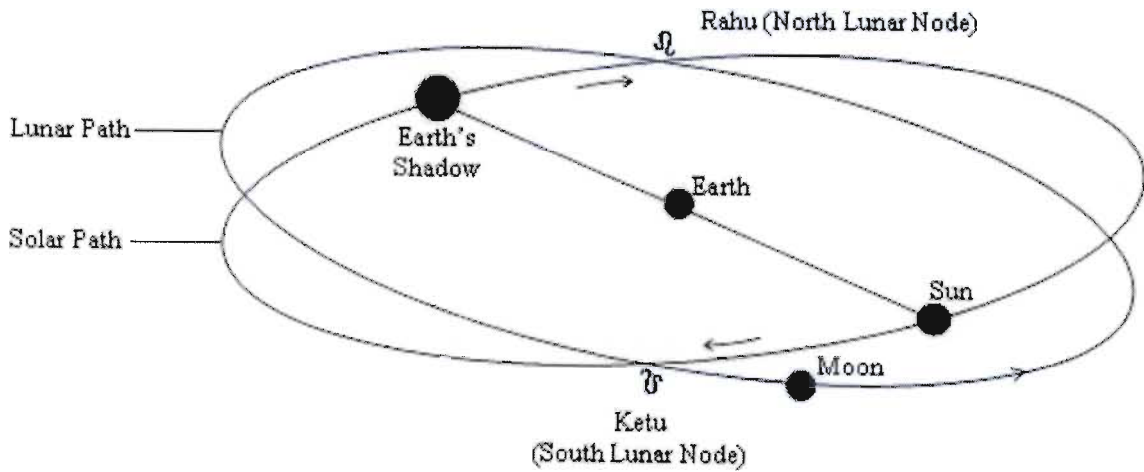


Figure 3: The movement of the sun and the moon, which to an observer on earth, may appear to be two great circles projected on a celestial sphere.

The sun's path or the solar ecliptic makes a complete revolution in one year. At the same time, the moon's circular path is completed in about one month. Every month the moon will overtake the sun, which moves more slowly. This is called new moon or in Sanskrit, *amavasya*. Usually the moon's path passes above or below the sun's path and no eclipse occurs. But over short periods of time the moon overtakes the sun at the place where their paths intersect. This causes the sun or the moon to be hidden from the earth's view and is thus

called a solar or lunar eclipse. These places of intersection are the north and south lunar nodes, or as they are referred to in Hindu mythology, *Rahu* and *Ketu*. Therefore, using mythology, *Rahu* and *Ketu* are said to devour the Sun and the moon. This implies that ancient Indians were fully aware of the causes and occurrences of eclipses.

However regarding the beliefs of the ancient Indians, religious leaders still concede power to the eclipse. This is done in order to derive the days of either auspicious or inauspicious events or days in the calendar. Thus the main planets that are involved in the occurrence of the eclipse are that of the nodes of the moon, *Rahu* and *Ketu*. Those born under these ruling planets often have karmic ties and are therefore are bound to fulfill the destiny prescribed by their past. At the times of an eclipse all daily activity ceased – all temples were closed, and many people took baths in the river Ganges, chanting prayers (Srimad Bhagavatam, Ch. 1). This demonstrates the strong beliefs of the ancient Indians on such beliefs.

5.6.1 The Importance of the Diameters of the Sun and Moon

The *Surya Siddhanta* states that firstly both *Rahu* and *Ketu* are the north and south nodes of the moon respectively. Chapter 4 introduces us to the dimensions of the sun and moon. The diameters are regarded by Burgess (1859: 268) as the mean diameters measured in a Hindu mathematical term called *yojanas*. The *yojana* is a peculiar way of measurement in that it is divided into cries (*kroca*). This refers to the distance to which a cry may be audible. The *Kroca* is then divided into bow lengths or poles and finally into cubits. Cubits are almost 18 inches in length. But basically one *yojana* is about ten miles.

In calculating the diameter of the sun's disk we would have to take the measurement in its original form of 6 500 *yojanas* and multiply it by ten. The moon's diameter in the *Surya*

Siddhanta is 480 *yojanas*. These calculations continue for lengthy period in the *Surya Siddhanta*. These calculations are however important for the precise determination of ecliptical activity and the approximate size of the shadow cast. After this has been established using the basic calculations of the mean diameters of the Sun and the moon, the interval between midnight and the moment of *opposition* and *conjunction* has to be determined. This then establishes the likelihood and duration of the eclipse.

The calculations for finding the diameters of the sun and moon are important as it pertains to the results and rate of the obscuration caused due to an eclipse. The mean diameters of both the sun and the moon have to be obtained first in order to do this.

Burgess (1859: 269) puts it into layman's terms by stating that the Hindu valuation of the parallax can be obtained from the time estimation, i.e. one minute on the moon's orbit = 15 *yojanas*. The Moon's horizontal parallax is equal the angle subtended at her centre by the earth's radius and since the earth's radius is equal to 800 *yojanas* and using the moon's orbit's mean distance of $1^\circ = 15$ *yojanas* then the angle subtended would = $53^\circ 20'$. This however is not accurate according to modern science which estimates it to $57^\circ 1'$. By this determination it is evident that the Hindus may have had a fairly reliable scientific method of justifying their beliefs in astrology. However in actuality eclipses occur not because of demons or any other unexplainable force. The *Surya Siddhanta* has attempted to rectify this by providing a calculative method to prove this. The following diagram provides us with a proper explanation.



Figure 4: Depiction of a lunar eclipse

The earth and the moon are not fixed objects. The moon is busy orbiting the earth. The earth is busy orbiting the sun and additionally rotating on its axis. This means that the spot on the earth where the umbra falls is always in motion and actually traces out a path.

5.6.2 The Existence of *Rahu* and *Ketu* in the *Surya Siddhanta*

While modern astronomy does not recognise the existence of the Indian shadow planets and their influence on human nature, the *Surya Siddhanta*, although amended to adhere to mainly western beliefs still mentions the existence of *Rahu* and *Ketu*. This is evident in Chapter 2 of the *Surya Siddhanta*. Both these shadow planets play an important role in the explanation to the causes of eclipses. Burgess (1859: 194) explains the verse: 'In like manner, also, the node, *Rahu*, by its proper force, causes the deviation in latitude of the moon and other planets, northward and southward, from their point of declination.' Burgess merely repeats Hindu mythology, which says that *Rahu* was a monster in the heavens that used to eclipse the Sun and moon in an attempt to devour them.

Although this may seem like a fable, well in verse anyway, the underlying explanation is valid in that the Hindu word for force is *ranhas* which explains the 'rapid violent motion' in which the light is covered by the darkness when such an occurrence of the eclipse takes place. The name *Rahu* is believed by Burgess (1859: 194) to have emerged from the word *ranhas*.

5.7 Varamihira: The *Kurma Chakra* System of the Astrology of Nations

This branch of astrology examines the chart of different nations—including countries, cities and states and the heads of government. And while this has not been documented by Burgess in the *Surya Siddhanta*, it was recorded in an ancient text by the astronomer Varamihira. The

outcome of a nation's progress is dependant on mundane astrology, which means that it requires the ruling constellation, ruling planet, and ruling sign.

The ruling constellation is one of three constellations, which follows the scheme of *Kurma Chakra*. India is divided into nine parts according to the ruling constellation. The starting point of the constellation is central India. Varamihira creates a unit of three constellations equalling 40 degrees while the west agreed that each sign of the 12 signs equals to 30 degrees.

Different constellations rule different states. India is governed by the signs of Virgo and Capricorn.

The Mars-Saturn conjunction results in mass deaths arising from explosions, railway accidents, strikes, riots and a state of lawlessness. The reason given for this is that Saturn is described as cold, melancholic, calculative and is generally a grave planet.

Saturn represents the weaker sections in society. These people are usually involved in politics. Saturn represents frustration, delay and disappointment. It influences the rivers, coloured races, death, storms and the working class. *Rahu* rules over secret plots, divisions in society and is mischievous in nature. It represents reptiles, worms, ghosts, political plots and exiles.

Combined these two 'planets' represent sorrow, conflicts and suspicion. Saturn by its own nature is not malefic, however when combined with *Rahu*, *Ketu* or Mars it causes turmoil and destruction. A modern time example of this was on January 21, 1991, when the US air force invaded Iraq. This occurred again on March 20, 2003, when Iraq was once again invaded.

Therefore the theory of the stars controlling our destiny is very much prevalent in Vedic astrology.

It is based upon the *Rnanu Bandhanas* or karmic ties. Modern astrology is based upon the principle of the individual's free will. While modern astrology has over the centuries adopted new ideas, in this dissertation I would like to investigate to what extent Vedic astrology has been influenced by other traditions. Vedic astrology has maintained much of its mysticism and philosophical character. The main belief was that as humans living in a material world it is necessary for us to connect with our universal soul in order to create a balance. The Indians were more interested in the philosophical nature behind astrology and did not focus so much on the science behind it. It is possible that the Greeks influenced Indian astrology to the extent that differential calculations were introduced by Aryabhatta, an Indian astronomer, in order to arrive at more accurate answers.

Modern astrology is based upon the Sayana or the Tropical Zodiac; Vedic astrology uses the Sidereal Zodiac. While the former relates to the earth's connection to the sun, the latter relates to the planetary connections to the stars. It all depends on the region from which the stars or planets are observed. A star is defined as a point of cosmic light in Vedic astrology and the word *nakshatra* literally means 'star' in Sanskrit. The ancient Indians also used a system of incorporating myths into astrology, more so than the Greeks. The Vedic zodiac is divided into twenty-seven signs and not twelve as the Greek zodiac is.

Vedic Aryans in fact deified the sun, stars and comets. Astronomy was then interwoven with astrology and since ancient times Indians have involved the planets (called *Grahas*) with the determination of human destiny.

The *Rnanu Bandhanas* relate to the karmic ties, which bind us to this earth. The ruling planet determines the deeds of our past lives at the time of our birth. *Rahu Ketu* is considered as the *chayya grahas* (shadow planets) and forms an important role in karmic ties. Since they are the points of ecliptic activity, they are able to obstruct the light from both the sun and the moon, and are therefore responsible for the process of life.

5.8 The Gunas of Ancient India

The *Gunas* are elements, which make up the characteristics of a person. In Vedic astrology a *Guna* is considered to be of a mental nature, but also has the ability to affect the physical body. They are represented as *Sattva* (gods), *Rajas* (Humans) and *Tamas* (Demons) which each relate to the temperament of the person who is born under each *Guna*. The characteristics of each are, *Sattva*, a symbol of purity in thoughts and so in actions: *Rajas*, the cycle of birth on earth, and the need for procreation, and *Tamas*, who form attachments to the physical. Those who are born under the *Sattvas* have good temperaments and are calm in distressing situations. The *Rajas* are human with human temperaments either good or bad and contain human qualities; they also have the need for material well being. *Tamas* have bad temperaments and can be violent at times depending on the situation. The twenty-seven fold zodiac is then divided among these three *Gunas*. Each sign of the zodiac then obtains its temperament from the *Guna* under which it happens to fall. The following table sets out the twenty-seven fold zodiac into their respective temperaments:

Sattva(Godly temperaments)	Rajas(Humanly temperaments)	Tamas(Demonic Temperaments)
Ashwini	Bharani	Krittika
Mrigisira	Rohini	Ashlesha
Punarvasu	Ardra	Magha
Pushya	Purva Phalguni	Chitra
Hasta	Uttara Phalguni	Vishakha
Swati	Purva Ashadha	Jyeshtha
Anuradha	Uttara Ashadha	Mula
Shravana	Purva Bhadra	Dhanishta
Revati	Uttara Bhadra	Shatabishak

Table 2: The *nakshatras* in terms of their temperaments

Combined with these Gunas is another important aspect, in obtaining the information that was needed for the well-being of the individual. This concept is referred to as the *doshas*, meaning faults or weaknesses. The theory behind it is that every individual may contain certain symptoms or diseases and when these symptoms are aggravated, then the disease surfaces. With the aid of the *doshas* we can establish the weaknesses of the individual prior to the start of the disease. The *doshas* depend on the birth sign of the individual as some weaknesses are prevalent in certain groupings of people. It works not only in the physical context but also on a deeper one i.e. the spiritual. Hence the *doshas* are the life energy force known as the *prana*.

There are three elements of the *doshas* which are similar to the western elements of earth, air and fire. The first of these elements is *vata* or air. Literally translated *vata* means wind and its natural qualities represent action, sensation and enthusiasm. The individuals born under the element of *vata* have the characteristics of its element, which are perception, inspiration, communication, action and drought. *Vata* people often display a nervous disposition, always needing to consume their own energy or *prana*. Their main weakness in terms of their character is an attention deficit and their constant need for finding a perfect balance in their ways of life.

The next element is *pitta* or fire – the requirements for fire is the ability to consume and digest. *Pitta* produces heat and controls the digestive system. As this quality may suggest the characteristics of *pitta* are hunger, thirst, intelligence and vision and the individuals born under this element display characteristics of activity, motivation and creativity but are also hot-tempered. The last element is *kapha* or water. Water is required for sustenance and the physical distresses that are related with *kapha* are the stability of the body, potency, moisture of the joints. This means that in turn those born under the water signs are calm, philosophical and patient. The following table assigns the Vedic zodiac into their elements:

Vata (Air Signs)	Pitta (Fire Signs)	Kapha (Water Signs)
Ashwini	Bharani	Krittika
Ardra	Mrigisira	Rohini
Punarvasu	Pushya	Ashlesha
Uttara Phalguni	Purva Phalguni	Magha
Hasta	Chitra	Swati
Jyesta	Anuradha	Vishakha
Mula	Purva Ashadha	Uttara Ashadha
Shatabishak	Dhanishta	Shravana
Purva Bhadra	Uttara Bhadra	Revati

Table 3: The zodiac in relation to the natural qualities/elements

Chapter Six: Conclusion

Astrology and astronomy have remained an integral part of modern society. This is not unusual as throughout what may be regarded by the reader as the ancient era, science and religion were always on opposing ends of the intellectual spectrum. However both these concepts pertained to the foundation and belief systems that have remained intact. And both of these ideals became equally important in the evolution and prosperity of man. I have included astronomy in this dissertation as I consider astrology as a pseudo science. Although I disagree, Barton (2005:15) labels the concept of a pseudo science as containing a certain amount of falsehood on the part of the practitioner. By analysing aspects of astrology in the ancient world I must admit that the myths did contain falsehoods but the science behind these were almost accurate. The reason I believe this is that myth is often used to gain perspective when addressing difficult concepts and I do believe that astrology does fall in this category.

In this dissertation the topic of astrology was chosen in that it served as a basis of influence and understanding between the ancient Greek and Indian cultures. No nation alone could have established the 'perfect' system without borrowing and using the knowledge gained in an effective way. What I have attempted to prove was that astrology did fit into ancient cultures and was easily explained as having some effects on natural cycles on earth. For the movements of the planets do affect some areas of nature e.g. the waxing and the waning of the moon does affect the high and low tides.

Now we can establish the nature of influence. The first important factor that is found in Ptolemy's *Tetrabiblos* is that he gives us the nature of the planets and the effects that these characteristics have on the temperaments of those individuals born under these ruling elements. Burgess states that the Hindu system is not one pertaining to nature and not even one interpreting the effects of nature. According to Burgess, relying on the *Surya Siddhanta*,

as his main source, it is a system built on assumptions and has absolutely no foundation in nature. The main problem with Hindu astrology is that while it provides us with detailed information on issues of human difference, for example, it leaves us with no explanation in terms of science. The reason for this opinion can be established in Chapter 1 (SS, 1858 p153), when looking at the chronological table on the ages. There is no basis for the ages, and no visible systematic way of concluding the periods in time. Burgess in his notes on the *Surya Siddhanta* (1859: 471) states that all this information emanated from one common source or school of thought. This school imposed its ideals and scientific beliefs on the entire nation.

The question then raised is, if the Greeks had their own system of calculating astronomical phenomena, and the ancient Indians had their own system, then under which system of influence did both these cultures agree upon representing?

Burgess is of the opinion that the Hindu system is an offshoot of the Greek one, and the reason he gives us is that, he believes that the Indians had an inaptitude for observation, and the recording of facts. The point that becomes clear is that the Indians, more often than not, intertwined science and religion, incorporating myth and superstition into their scientific branches. This made it rather difficult in establishing what was actually true and relevant from what they believed to be true and relevant. Burgess also states that after the Hindus had obtained the system of ecliptical knowledge from the Greeks (1859: 472) they still mainly dealt with the effects of the sun and the moon. This is true to a large extent in that the Hindus regarded the sun and the moon as the focal point of the universal elements; however they did also acknowledge the other existence and influence of other planetary elements. They created the lunar months, which was in concordance with the solar year. There is no explanation for this and no records to support their explanation. The main problem of this deduction is that the Hindus left no evidence of their observations and calculations until approximately the 17th

century AD. Therefore he arrives at the conclusion that the ancient Indians must surely have been influenced, in terms of astronomy, by the ancient Greeks.

The direct evidence of influence of the Greeks upon the Hindus is in terms of calculation in astronomy. The first of which was the calculation of the epicycles, in establishing the movements and positions of the planets. This also pertains to the fact that the names, of the signs of the zodiac changed from a twenty-seven sign zodiac to that of a twelve fold on in the case of the Hindus. The divisions of the circle into signs, degrees, minutes and seconds are the same for both cultures. The reasons for stating that these signs originated in Greece are that firstly, the Hindus followed the lunar system and these signs represent the solar system of signs, and secondly, which is the more obvious reason, is that these signs belong to certain fixed arcs on the ecliptic, being derived from the constellations occupying those arcs. The Hindus on the other hand calculated these divisions in thirty degree points apart. Again no explanation is given in the *Surya Siddhanta*.

But stating this Burgess (1859: 477) also says that it does not mean that this is purely of Greek origin either, but that these cultures may have had a common source, which was brought to the Indians by the Greek invasion in 250BC. The lunar division of the zodiac can be attributed to the Hindus, in the opinion of Burgess (1859: 477). The Solar division of the zodiac into twelve signs can be attributed to the Europeans and not specifically Greeks. But this is according to the recorded evidence. But Burgess (1859: 477) is of the opinion that the names of the twelve-fold zodiac may have existed in India prior to the Greeks. He follows the opinion of Ideler and Lepsius (Burgess 1859:477.). Ideler is inclined to believe that the Orientals had names, but not constellations, for the Dodecameria. Lepsius regards it as a natural assumption that the Greeks at that period when their sphere for the most part unfilled should have added to their own, the Chaldean constellation from which the twelve divisions

were named.' It is uncertain whether the term Oriental actually meant Chaldean or some other eastern nation.

Since we established the general overview of influence, we will return to the similarities and differences found in Ptolemy's *Tetrabiblos* and the Hindu *Surya Siddhanta*. In the first part of the *Tetrabiblos* Ptolemy establishes the natural influences of the planets, their characteristics and their effect on human nature. The *Surya Siddhanta* does not mention any of these characteristics or their effects on human nature. It does begin in Chapter 1 with the calculation of the diameters of the planets and their relationship to the day count and the concept of the ages arises.

Ptolemy in the *Tetrabiblos* speaks of the seven ages of man. The time period of an age is established by the ruling planet. This planet has certain characteristics which it bestows upon any individual born during this period. But it also correlates to the lifetime of man and uses the example of the moon, which governs infancy until the age of four, and as man develops and grows each planet bestows certain characteristics on him. The *Surya Siddhanta* on the other hand also establishes time periods or ages but it does not give us an accurate time frame. This is expressed in divine years, which are estimated to the modern term of eon. It does however provide us with some human characteristics during those ages but not individual characteristics. For example, the present age is the age of *Kali*. This age is regarded by Hindus as the final age of life on earth, before a new beginning. The age of *Kali* brings with it a destructive force; it is described as an age of the unfortunate, the degenerates of mankind. It is an age of sorrow, war, and suffering. While it reveals much information, the *Surya Siddhanta* fails to supply us with an explanation to the reason for this but merely states that it has being recorded from the ancient scriptures, i.e. the *Vedic Puranas*. However these ages do resemble the Golden, Silver, Bronze, and Iron ages of the Greeks. And the

characteristics given to mankind during those ages are similar. But the *Puranas* which this information has been ascertained is estimated to be 4000 years old.

The concept of fate, destiny, and human difference appear briefly in the *Tetrabiblos*, but no detailed analyses are established. The *Tetrabiblos* merely states the characteristics of individuals born under a ruling planet. Ptolemy establishes the importance of the universal bodies and their alignment at the time of birth of the individual. He provides us with a lengthy explanation on these characteristics but fails provide us with an idea on the concept of destiny or fate. He merely states that these individual characteristics give rise to the sort of life an individual be succumb to. Fate and destiny in Hindu terms relate to the doctrine of *Karma*.

On the systems of belief, Ptolemy may have written the *Tetrabiblos* in an attempt to demythologise astrology. The ancient Greeks once believed in the gods, who controlled their destinies and the will of man. They dictated the outcome of his prosperity or his demise. However they did not readily accept that an outer influence existed, which could have been responsible for such occurrences. They found the need to explore these concepts further—in terms of science. Although the ancient Greeks believed in fate and destiny for which we can obtain the information through reading books by authors such Homer, they did not incorporate anything on individual human difference. This was left to the astrologers to define. Ptolemy does not mention this in any detail but merely stated that certain people obtain their personalities from the characteristics of the ruling planet at the time of their birth. He tries to justify astrology in terms of science and logical reasoning, but refrains from claiming it to be a science itself in order to defend its validity.

The ancient Indians did not find the need to justify their beliefs in terms of science. The myth of Kartika and Ganesha might be able to explain why this was so. The myth states that Shiva and Parvati had two sons Kartika and Ganesha. Kartika was a warrior God while Ganesha was rather frumpy, and had the head of an elephant. In order to marry, they were

assigned to travel the universe and whoever completed this first would be the first to marry. While Kartika began his journey, Ganesha gathered both his parents and began to walk around them. When asked why, he replied that his parents were his universe and that he did not need to travel to all ends to know that. The Indians did not find the need to travel the world to find answers to questions that they understood. They followed philosophical beliefs, which might explain why they did not record most of their information on many subjects. The *Surya Siddhanta* is a text, which is described by Burgess (1859: 145) as one of a combination of religious beliefs and of scientific reasoning. There is no author to the *Surya Siddhanta* instead it is considered to have been written through divine revelation of the Sun God, i.e. *Surya* by the *maharishis* or high priests in ancient India. And although the *Surya Siddhanta* is a relatively new text in Indian literature it does refer back to the ancient texts like the *Rig Veda* and the *Vedangas*, when concerning topics such as astronomy. In no way am I implying that the Vedic Indians could not distinguish between the rational and the mythical; however what I am stating is that they found no need to do so. Instead they easily welcomed new concepts and practices as part of their own culture. The other factor is that what we might consider rational now may have differed from the term rational then. It is important to remember that subjects such as magic, divination and the effects of potions were all considered reasonable and logical.

However, the *Surya Siddhanta* was written a long time after astrology was in practice, they might have failed in explaining their concepts in terms of science, but there is much understanding in their systems of belief in comparison to the ancient Greeks who may have been superior in terms of scientific reasoning. I believe through this research that aspects of science did exist behind astrology in both these cultures, but while the ancient Greeks sought to justify it terms of pure science, the ancient Indians focused mostly on the philosophical areas. Astrology was a combination of both; however they seem to agree on certain areas and

disagree on others. For instance I have found that the ancient Greeks differed from the Indians in the aspects of the division of the zodiac, although both had a systematic way of calculating the positions and naming of the signs. The similarities were based in areas of the astrology of nations and on the idea of fate and destiny. Although on the astrology of nations, in the Indian context the writings of Varamihira, seems to pre-date the writings of any Greek documents on that particular subject. But Varamihira focused only on India while Ptolemy focused on the world in general. Therefore in concluding this dissertation I would like to state that the Greeks were organised in their collection of scientific information while the Indians used the oral tradition until they felt the need to document their beliefs.

Glossary

1. **Amavasya:** Refers to the new moon in Sanskrit.
2. **Animate/Inanimate:** animate refers to something real that is given motion and is brought to life, while inanimate refers to something lifeless and without action or motion.
3. **Aspect:** A Greek word related to looking or seeing. According to Greek optical theory, looking is to cast a ray out from the eye to an object, seeing a passive reception of the perception back from an object. In astrology, this refers to the divisions of the circle by numbers starting with 2. A conjunction is not technically an aspect because there is no looking or seeing involved, only a presence.
4. **Astrolabe:** An instrument consisting of a graduated circle with a movable arm by which the angles above the horizon could be taken.
5. **Benefic/Malefic:** These refer to planets that are naturally beneficial or maleficent, either conducive to life on the part of the individual or requires a great effort on the part of the individual, in order to sustain a productive life.
6. **Bi-corporeal:** Literally means double-bodied, refers to the mutable signs Gemini, Virgo, Sagittarius and Pisces.
7. **Bound:** One of the dignities also known as terms (from the latin - terminus), thought of as delimiting a certain circumstance within a certain confine of life. Often used in life expectancy calculations.
8. **Conjunct / Conjunction:** A planet that is in the same sign as another planet (by Greek standards). Later astrologers applied an 'orb of light', standard by which planets outside this orb are not conjunct even if in the same sign. This 'orb of light' is also used with aspects. In the last century, the orb of light became confused with orb of aspect.
9. **Decan:** One third of a sector of a sign. Each sign contains 3 decans and each decan is divided into two faces, a negative and a positive, and each has its own ruler.
10. **Destroyer:** That planet in a primary or other direction that brings life to an end by making a malefic contact with the apheta.
11. **Dhruva:** refers to the polar latitude but also means fixed.
12. **Domicile:** A zodiac sign where the planet is most comfortable and therefore has authority. The most important dignity according to medieval and later sources. According to Hellenistic sources each type of dignity had its own purpose.

13. **Dodekameria:** Also known as 'twelfth part'. This is the division of a sign into 13 equal sections, based upon the moon's monthly cycle against the background stars.
14. **Eclipse:** The movement of a heavenly body such as the moon or the earth in the way of the sun's rays blocking the light from reaching the earth or the moon. A special case of occultation involving the disturbance of light.
15. **Exaltation:** One of the essential dignities, may have roots older than the dignity of house lord, but now considered by most astrologers to be slightly less important than domicile lords.
16. **Fixed:** Represent the signs of the quadruplicity i.e. Taurus, Leo, Scorpio and Aquarius.
17. **Fortune/Infortune:** It is either with reference to the lot of fortune/infortune or the benefic/malefic planets respectively.
18. **Halo** is defined as a luminous ring encircling an astronomical body, but not infrequently confounded with 'aureola,' or 'nimbus,' a somewhat similar phenomenon worn as a head-dress by divinities and saints. The halo is a purely optical illusion, produced by moisture in the air, in the manner of a rainbow; but the aureola is conferred as a sign of superior sanctity, in the same way as a bishop's mitre, or the Pope's tiara.
19. **Horoscopes:** The Greek word for ascendant, meaning 'hour marker'. The Greek term is more flexible and can mean any house that can serve as a first house for counting purposes.
20. **House:** One of the 12 divisions of the great circle based upon one's own horizon and meridian. Used for measuring a planet's strength in a given location. Topical divisions were based upon whole signs in the early Hellenistic period. Can also refer to the planet's dignity; i.e. 'being in one's own house or domicile' (or sign).
21. **Lights:** Astrological reference to the sun and moon or all bodies of light.
22. **Lord:** Refers to the primary ruler of a sign, usually by domicile.
23. **Lot:** This refers to the Greek concept of lot, referring to rebirth and destiny.
24. **Mid-heaven:** The intersection of the meridian with the ecliptic by modern standards. By Hellenistic standards it refers to the 10th sign from the *horoskopos* or ascendant.
25. **Mutable:** Another term for bi-corporeal.
26. **Nakshatra:** Literally meaning light or star refers to the twenty-seven fold Vedic zodiac.
27. **Opposition:** An aspect based upon two planets being in opposite signs or 180 degrees apart.
28. **Oriental:** A planet of lesser zodiacal longitude, that was already overtaken by the sun and can be seen before sunrise.

29. **Rods** are cells found in the human eye that detects very faint light, however astronomers also use this term when relating to vision of astronomical elements indirectly or slightly of the axis.
30. **Ruler:** Usually refers to the domicile lord of a sign or other place.
31. **Shadow Planets:** The Shadow planets refer to the north and South nodes of the moon. In western astronomy they don't qualify as planets but in Hindu mythology they represent the head and tail of the Dragon. They are referred to as such because of their Karmic ties.
32. **Significator:** A planet for a given subject that is either directed, or perfected to another place or planet.
33. **Term:** Each sign consists of terms, each ruled by one of the five classical planets (Mercury, Venus, Mars, Jupiter, and Saturn). A planet in its own term is strengthened, while a planet in the term of another is affected by that planet. Thus Saturn in terms of Venus has reduced potential for malevolence, while Venus in terms of Mars has less power for benefit, more power of action and so on.
34. **Trigon:** an astronomical term which refers to the degree at which a planet begins its course in relation to its ruling sign and in accordance with varying sects.
35. **Trine:** An aspect between 2 planets in signs of the same element, or 120 degrees apart.
36. **Triplicity:** This is one of the essential dignities based on sect, sign or element, also known as trigon.
37. **Twelfth-parts:** Depending upon the context, can refer to either the signs themselves or the *dwadasamsa*, or *dodekameraia*.
38. **Umbra:** Refers to the shadow that is projected during the occurrence of an eclipse.
39. **Vikshepa:** refers to the polar latitude.

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